ABSTRACT

Method and apparatus for providing real-time data indicative of the isotopic composition of formation fluids during drilling. The method includes the steps of: (a) providing a reference fluid having a known isotopic composition in a reference cell; (b) capturing a sample of formation; (c) providing at least one laser beam; (e) passing a beam through the reference fluid, measuring the reference-measurement beam before and after it passes through the reference fluid; (f) and passing a beam through the sample, measuring the beam before and after it passes through the sample, and calculating a first isotope concentration from those measurements. The measurements can provide information relating to the carbon isotopic composition of individual compounds in hydrocarbon gas mixtures, with the individual compounds including methane, ethane, propane, iso- or normal butane, or iso- or normal pentane.